REMARKS/ARGUMENTS

Favorable reconsideration of this application in view of the above amendments, and in light of the following discussion, is respectfully requested.

Claims 1-14 and 17-21 are pending, with Claims 6, 7, 13, and 14 withdrawn from consideration. Claims 1-3, 5-10, and 12-14 are amended, Claims 15 and 16 are canceled without prejudice or disclaimer, and Claims 17-21 are newly submitted. No new matter is introduced.[1]

In the Office Action, Claims 1, 8, 15, and 16 were rejected under 35 U.S.C. § 102(b) as anticipated by Tsukazaki (U.S. Patent No. 5,837,094); Claims 2, 4, 9, and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Tsukazaki in view of Itaya (Japanese Patent Publication No. 62-210270); Claims 3 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Tsukazaki in view of Itaya and Ando (U.S. Patent No. 6,012,334); and Claims 5 and 12 were rejected under 35 U.S.C. § 103(a) as unpatentable over Tsukazaki in view of Nashida (Japanese Patent Publication No. 01-293378).

Independent Claims 1 and 8 each recite a substrate processing unit. Each of amended Claims 1 and 8 recite the substrate processing unit includes a process vessel and an exhauster that includes rotor blades that exhaust the interior of the processing vessel by rotation of the rotor blades. Claims 1 and 8 further recite an operating state detector *that detects a change in an amount of or a molecular weight of a gas that collides with the rotor blades.*

[1] Support for the amendments to Claims 1 and 8 can be found at least at, for example, page 13, lines 14 to 20 and page 22, line 17 to page 23, line 12 of the specification as originally filed. Further, new claims 17 to 19 are supported at least by, for example, page 21, line 19 to page 22, line 10, page 23, line 23 to page 24, line 1 and page 21, lines 9 to 18 of the specification as originally filed.

Turning to the applied references, Figure 1 of Tsukazaki illustrates a semiconductor manufacturing apparatus that includes a deposition chamber 4, a stand-by chamber 5, a gas supply system 8, and an exhaust pipe 12 to exhaust the gas in the deposition chamber 4 external to the apparatus.[2] Figure 1 of Tsukazaki also depicts an end point detection controller 31 and a particle monitor 15 that includes a laser irradiation system 15a, a detector 15b, and windows 15c and 15d.[3] Tsukazaki describes "the end point detection controller 31 observes the time-varying amount of the generation of dust during the plasma cleaning, counted by the particle monitor 15, and decides that the end point is a time point when the first dust generation is finished (for example, after 30 seconds counted from the generation of dust in the first embodiment shown in FIG. 1), that is, a time point where no tungsten fine particle (no generation of tungsten-dust) is generated."[4] However, Tsukazaki fails to disclose or suggest an operating state detector *that detects a change in an amount of or a molecular weight of a gas that collides with the rotor blades* of an exhauster that exhaust the interior of the processing vessel, as recited in Claims 1 and 8.

Instead, as can be seen in Figure 1 of Tsukazaki, the particle monitor 15 merely detects particles that pass by the windows 15c and 15d in the exhaust pipe 12. These detected particles do not necessarily correspond to *an amount of or a molecular weight of* a gas that *collides with the rotor blades* of an exhauster that exhausts the deposition chamber 4.

None of Itaya, Ando, or Nashida cure the deficiencies in Tsukazaki. Accordingly, even the combined teachings of Tsukazaki, Itaya, Ando, and Nashida fail to disclose or

---

[2] See Tsukazaki, at col. 5, lines 20-50.
[3] See Tsukazaki, at col. 5, lines 53-64.
[4] See Tsukazaki, at col. 6, line 66 to col. 7, line 3.

suggest all of the features in independent Claims 1 or 8. It is submitted Claims 1, 8, and the claims depending therefrom are in condition for allowance.

Dependent Claims 2, 4, 9, and 11 recite further features that are not disclosed or suggested by the cited references. Claims 2 and 9 recite the operating state detector includes a vibration detector that detects *the change in the amount of or the molecular weight of the gas that collides with the rotor blades* by detecting a vibration of the exhauster. Claims 4 and 11 further define that the end point detector detects the end point based on a change in the intensity of the vibration.

By contrast, Tsukazaki describes a laser irradiation system that counts particles *in an exhaust pipe*. Itaya describes a vibration detector that detects excessive vibration, but does not detect *the vibration generated by the gas colliding with the rotor blades*. Neither Tsukazaki nor Itaya disclose or suggest measuring the vibration of the exhauster induced by *the gas colliding with the rotor blades of the exhauster*. Accordingly, even the combined teachings of Tsukazaki and Itaya fail to disclose or suggest all of the features of Claims 2, 4, 9 and 11. It is submitted Claims 2, 4, 9 and 11 are in condition for allowance.

Dependent Claims 3 and 10 recite further features that are not disclosed or suggested by the cited references. Claims 3 and 10 respectively depend from Claims 2 and 9 and recite the vibration detector includes a sound wave detector that detects a sound wave produced by the vibration of the exhauster. In view of the amendments to Claims 2 and 9, the sound wave detector recited in Claims 2 and 9 measures the sound wave produced by the vibration of the exhauster that is *induced by the gas colliding with the rotor blades of the exhauster*.

Turning to the applied references, neither Tsukazaki nor Itaya disclose or suggest a sound wave detector. Ando describes a cantilever resonator formed on a silicon substrate, but fails to disclose or suggest detecting the sound wave produced by the vibration of a gas colliding with the rotor blades of an exhauster. Accordingly, even the combined teachings of Tsukazaki, Itaya, and Ando fail to disclose or suggest the sound wave detector recited Claims 3 and 10. It is submitted Claims 3 and 10 are in condition for allowance.

Dependent Claims 5 and 12 recite further features that are not disclosed or suggested by the cited references. Claims 5 and 12 recites the exhauster includes a rotatable body of revolution for exhaust, and the operating state detector includes a rotation detector that detects *the change in the amount of or the molecular weight of the gas that collides with the rotor blades* by detecting a rotation of the body of revolution.

Turning to the applied references, Tsukazaki fails to disclose or suggest a rotation detector. Nashida describes a detector that detects the rotational velocity of the exhaust fan and determines whether or not the exhaust is sufficient for preventing a high temperature. However, the detector in Nashida does not measure the rotational frequency of the rotor *based on the gas colliding with the rotor of the exhauster*. Accordingly, even the combined teachings of Tsukazaki and Nashida fail to disclose or suggest all of the features in Claims 5 and 12. It is submitted Claims 5 and 12 are in condition for allowance.

New Claims 17-19 recite further features that are not disclosed or suggested by the cited references. In particular, Claim 17 recites the end point detector detects the end point of the cleaning by determining whether the amount of or the molecular weight of a gas colliding with the rotor blades stabilizes with the progress of the cleaning following a period of

initially instability; Claim 18 recites the operating state detector includes a vibration detector that detects a vibration of the exhauster; and Claim 19 further recites the vibration detector includes a sound wave detector that detects a sound wave produced by the vibration of the exhauster. None of the cited references, either alone or in combination, disclose or suggest these features, particularly in combination with the features in Claim 1, from which they depend. Accordingly, new Claims 17-19 are believed to be in condition for allowance.

New Claims 20 and 21 recite, in means plus function language, features similar to those discussed above with respect to Claims 1 and 8. Therefore, although differing in scope, Claims 20 and 21 are believed to be in condition for allowance for at least the same reasons as that discussed above with respect to Claims 1 and 8.

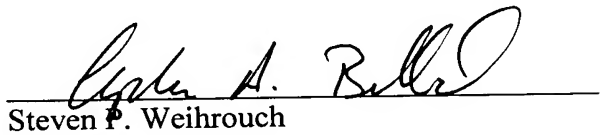
With regard to withdrawn Claims 6, 7, 13, and 14, it is respectfully requested that these claims be rejoined and allowed in accordance with MPEP §821.04, as Claims 6 and 7 include the subject matter recited in Claim 1, which is believed to be allowable, and as Claims 13 and 14 include the subject matter recited in Claim 8, which is believed to be allowable.

For the reasons discussed above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance for Claims 1-14 and 17-21 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Steven P. Weihrouch
Attorney of Record
Registration No. 32,829

Christopher A. Bullard
Registration No. 57,644

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 08/07)